AMENDMENTS

In the Claims:

Please amend the claims as indicated hereafter.

1. (Currently Amended) A spectral correlator, comprising:

a specimen; and

an optical device configured to collect light from the specimen, the optical device having a wavelength spreading element configured to disperse, based on wavelength, a received first spectra of the light collected from the specimen, the optical device configured [[and]] to optically determine a similarity of ~~a received~~ the dispersed first spectra ~~of the light collected from the specimen~~ and a second known spectra by directly comparing the dispersed first spectra ~~light~~ to a representation of the second known spectra.

2. (Original) The spectral correlator of claim 1, wherein the optical device is further configured to output a signal indicative of the similarity.

3. (Original) The spectral correlator of claim 2, further comprising a detection device configured to sense the similarity signal and determine, based upon the similarity signal, whether a substance, represented by the second known spectra, is present in the specimen.

4. (Currently Amended) ~~The spectral correlator of claim 3,~~ A spectral correlator, comprising:

a specimen;

an optical device configured to collect light from the specimen and to optically determine a similarity of a received first spectra of the light collected from the specimen and a second known spectra by directly comparing the light to a representation of the second known spectra, wherein the optical device comprises a first lens configured to perform a Fourier transform on the received first spectra, and wherein the optical device is further configured to output a signal indicative of similarity; and

a detection device configured to sense the similarity signal and determine, based upon the similarity signal, whether a substance, represented by the second known spectra, is present in the specimen.

5. (Original) The spectral correlator of claim 4, further comprising a spatial filter containing the Fourier transform of the second known spectra.

6. (Original) The spectral correlator of claim 5, wherein the first lens transmits a signal indicative of the Fourier transform of the received first spectra to the spatial filter.

7. (Original) The spectral correlator of claim 6, further comprising a second lens configured to receive a second signal from the spatial filter and transmit a signal indicative of the similarity of the received first spectra and the known spectra onto the detection device.

8. (Original) The spectral correlator of claim 7, wherein the specimen is in direct proximity to the optical device.

9. (Original) The spectral correlator of claim 7, wherein the specimen is remote from the optical device.

10. (Previously Presented) The spectral correlator of claim 9, wherein the spatial filter, the first lens, and the second lens are arranged such that a variation with time of the similarity signal indicates a concentration of a specimen indicated by the second known spectra.

11. (Previously Presented) The spectral correlator of claim 4, further comprising a spatial filter, wherein the spatial filter contains the representation of the second known spectra.

12. (Original) The spectral correlator of claim 11, wherein the first lens transmits a signal indicative of the Fourier transform of the received first spectra to the spatial filter.

13. (Original) The spectral correlator of claim 12, wherein the optical device further comprises a second lens configured to receive a second signal from the spatial filter indicative of the first signal and the representation of the known spectra.

14. (Original) The spectral correlator of claim 13, wherein the second lens is configured to focus the received second signal and transmit a signal indicative of the similarity of the received first spectra and the known spectra onto a detection device.

15. (Original) The spectral correlator of claim 14, wherein the specimen is in direct proximity to the correlator.

16. (Original) The spectral correlator of claim 14, wherein the specimen is remote from the optical device.

17. (Previously Presented) The spectral correlator of claim 16, wherein the spatial filter, the first lens, and the second lens are arranged such that a variation with time of the similarity signal indicates a concentration of the specimen indicated by a second known spectra.

18. (Currently Amended) A spectral correlator, comprising:

a specimen;

an illuminating device configured to illuminate the specimen; and

an optical device configured to filter light from the specimen using ~~an optical~~ a spatial filter indicative of a known spectra and to determine, based on the filtered light, [[the]] a similarity of a received spectra defined by the light and the known spectra, the optical device having a wavelength spreading element configured to disperse the spectra, the filter configured to receive the dispersed spectra.

19. (Original) The spectral correlator of claim 18, wherein the optical device is further configured to output a signal indicative of the similarity.

20. (Previously Presented) The spectral correlator of claim 19, further comprising a detection device configured to sense the similarity signal and determine, based upon the similarity signal, whether a substance, represented by the known spectra, is present in the specimen.

21. (Currently Amended) ~~The spectral correlator of claim 20,~~ A spectral correlator, comprising:

a specimen;

an illuminating device configured to illuminate the specimen;

an optical device configured to filter light from the specimen using an optical filter indicative of a known spectra and to determine, based on the filtered light, a similarity of a received spectra defined by the light and the known spectra, wherein the optical device comprises a first lens configured to perform a Fourier transform on the received spectra, and wherein the optical device is configured to output a signal indicative of the similarity; and

a detection device configured to sense the similarity signal and determine, based upon the similarity signal, whether a substance, represented by the known spectra, is present in the specimen.

22. (Previously Presented) The spectral correlator of claim 21, further comprising a spatial filter, wherein the spatial filter contains the Fourier transform of the known spectra.

23. (Previously Presented) The spectral correlator of claim 22, wherein the first lens transmits a signal indicative of the Fourier transform of the received spectra to the spatial filter.

24. (Original) The spectral correlator of claim 23, wherein the optical device further comprises a second lens configured to receive a second signal from the spatial filter indicative of the first signal and the Fourier transform of the known spectra.

25. (Previously Presented) The spectral correlator of claim 24, wherein the second lens is configured to focus the received second signal and transmit a signal indicative of the similarity of the received spectra and the known spectra onto a detection device.

26. (Previously Presented) The spectral correlator of claim 25, wherein the received spectra is a Raman spectra resulting from the illuminating device illuminating the specimen and the known spectra is a known Raman spectra.

27. (Canceled)

28. (Previously Presented) The spectral correlator of claim 22, wherein the spatial filter contains a representation of the known spectra.

29. (Previously Presented) The spectral correlator of claim 28, wherein the first lens transmits a signal indicative of the Fourier transform of the received spectra to the spatial filter.

30. (Original) The spectral correlator of claim 29, wherein the optical device further comprises a second lens configured to receive a second signal from the spatial filter indicative of the first signal and the representation of the known spectra.

31. (Previously Presented) The spectral correlator of claim 30, wherein the second lens is configured to focus the received second signal and transmit a signal indicative of the similarity of the received spectra and the known spectra onto a detection device.

32. (Previously Presented) The spectral correlator of claim 31, wherein the received spectra is a Raman spectra resulting from the illuminating device illuminating the specimen and the known spectra is a known Raman spectra.

33. (Previously Presented) The spectral correlator of claim 32, wherein the spatial filter, the first lens, and the second lens are arranged such that a variation with time of the similarity signal indicates a concentration of the specimen indicated by a known spectra.

34. (Currently Amended) A spectral correlator, comprising:

a specimen;

means for receiving light reflected off and/or emitted by the specimen;

means for separating the light into its component colors; and

means for optically correlating the separated light ~~received~~ to determine [[the]] a similarity of the ~~spectra of the received~~ separated light ~~from the specimen~~ and a second known spectra, the correlating means having an optical filter for filtering the separated light, the optical filter indicative of the second known spectra such that the filtered light has an intensity indicative of the degree to which the spectra of the received light and the second known spectra are similar.

35. (Previously Presented) A spectral correlation method, comprising the steps of:

receiving light from a specimen;

optically performing a first Fourier transform on a first spectra of the light as the light is passing through a first lens to obtain a transformed first spectra;

optically multiplying the transformed first spectra with a representation of a known spectra to obtain a similarity signal;

focusing, via a second lens, the similarity signal on a detector;

providing an indication as to whether at least one substance is present in the specimen based on the similarity signal.

36. (Previously Presented) The method of claim 35, wherein the representation of the known spectra is a Fourier transform of the known spectra.

37. (Original) The method of claim 35, wherein the performing step, the multiplying step and the focusing step are optically performed via an optical device.

38. (Previously Presented) The method of claim 37, wherein the specimen is remotely located from the optical device.

39. (Previously Presented) The method of claim 37, wherein the specimen is housed proximate to the optical device.

40. (Original) The method of claim 35, wherein the first spectra is a Raman spectra, and the known spectra is a Raman spectra.

41. (Previously Presented) The method of claim 40, wherein the performing and multiplying steps are performed such that a variation with time of the similarity signal indicates a concentration of a specimen indicated by the known spectra.

42. (Previously Presented) A spectral correlation method, comprising the steps of:

receiving light from a specimen;

separating a first spectra of the light into its component colors;

optically multiplying the separated first spectra with a representation of a known second spectra as the light is passing through an optical component indicative of the known second spectra to obtain an optical signal indicative of the degree to which the first spectra and the known second spectra are similar; and

detecting the optical signal.

43. (Previously Presented) The method of claim 42, further comprising the steps of:

measuring an intensity of the optical signal;

comparing a value indicative of the measured intensity to a threshold; and

providing an indication as to whether at least one substance is present in the specimen based on the comparing step.

44. (Previously Presented) The method of claim 42, further comprising the step of providing an indication as to whether at least one substance is present in the specimen based on the optical signal.

45. (Currently Amended) A spectral correlation method, comprising the steps of:

receiving light from a specimen;

separating the light into its component colors;

filtering the separated light with ~~an optical~~ a spatial filter indicative of a known spectra corresponding to at least one substance such that a spectra of the separated light is optically multiplied depending on a similarity between the spectra of the separated light and the known spectra;

determining whether the at least one substance is present in the specimen based on the filtered spectra; and

providing an indication as to whether the at least one substance is present in the specimen based on the determining step.

46. (Currently Amended) ~~The method of claim 45,~~ A spectral correlation method, comprising the steps of:

receiving light from a specimen;

filtering the light with an optical filter indicative of a known spectra corresponding to at least one substance such that a spectra of the light is optically multiplied depending on a similarity between the spectra of the light and the known spectra, wherein the filtering step comprises the step of performing an analog multiplication of a Fourier transform of the spectra of the light with a Fourier transform of the known spectra;

determining whether the at least one substance is present in the specimen based on the filtered spectra; and

providing an indication as to whether the at least one substance is present in the specimen based on the determining step.

47. (Previously Presented) The method of claim 46, further comprising the step of performing a Fourier transform on the spectra of the light as the spectra of the light is passing through a first lens.

48. (Previously Presented) The method of claim 47, further comprising the step of performing an inverse Fourier transform on the filtered spectra as the filtered spectra is passing through a second lens.

49-51. (Canceled)

52. (Currently Amended) ~~The spectral correlator of claim 1, wherein~~ A spectral correlator, comprising:

a specimen; and

an optical device configured to collect light from the specimen and to optically determine a similarity of a received first spectra of the light collected from the specimen and a second known spectra by directly comparing the light to a representation of the second known spectra, the optical device [[is]] configured to focus all discrete wavelength lines of the spectra to the same spot.

53. (Currently Amended) ~~The spectral correlator of claim 1, wherein~~ A spectral correlator, comprising:

a specimen; and

an optical device configured to collect light from the specimen and to optically determine a similarity of a received first spectra of the light collected from the ~~first spectra~~ specimen and a second known spectra by directly comparing the light to a representation of the second known spectra, the optical device [[is]] configured to focus all discrete wavelength lines of the spectra to a single detector.

54. (New) The spectral correlator of claim 1, wherein the optical device has a spatial filter indicative of the second known spectra, the filter configured to receive and filter the dispersed first spectra.

55. (New) The spectral correlator of claim 54, wherein the spatial filter optically multiplies the dispersed first spectra based on the similarity.

56. (New) The spectral correlator of claim 18, wherein the filter optically multiplies the dispersed spectra based on the similarity.

57. (New) The spectral correlator of claim 34, wherein the filter optically multiplies the dispersed light based on the similarity.